Anadolu Orman Araştırmaları Dergisi
Anatolian Journal of Forest Research
http://dergipark.org.tr/ajfr

Public Perception of Forest in Forest Villages: The Case of Hanönü Forest District Directorate in Kastamonu Province

Hasan Emre Ünal[*1], **Üstüner Birben**[1]

[1]Çankırı Karatekin University, Faculty of Forestry, Department of Forest Economics, 18200, Çankırı/TURKEY

Research Article

ARTICLE INFO

Received: 29 June 2021
Accepted : 7 October 2021
DOI: https://doi.org/10.53516/ajfr.959223
*Corresponding author:
hemre@karatekin.edu.tr

ABSTRACT

Public perception of the forest is fundamental in determining how forests will be managed, protected, or improved. Thus, this paper examines the forest-people relations and conservation awareness of people living in or adjacent to the forest that dependent on forest resources in 6 villages within the boundaries of three different Forest Sub-district Directorates of the Kastamonu Regional Directorates of Forestry. Statistical analysis as independent t-test mean scores by gender awareness, ANOVA level of awareness by ages, ANOVA level of awareness based on education levels were used for data analysis. It is revealed with an independent-samples t-test that there is a significant difference in the scores for effect tree cutting on deforestation; perception of the forest; the importance of forest resources in terms of income generation; and awareness of rights for male and female conditions. We used One Way ANOVA for determining if a significant difference in means scores on the dependent variable exist across two or more groups. Accordingly, there is a significant effect of age groups on at the $p<0.05$ level for the awareness of rights, soil erosion on deforestation, and positive contribution of laws to forest protection. Also, there is a significant effect of education level groups on at the $p<0.05$ level for the effect of logging on deforestation and effect of soil erosion on deforestation.

Keywords: Forest, forest village, livelihood, conservation, perception.

Orman Köylüsünün Orman Algısı: Hanönü Orman İşletme Müdürlüğü Örneği (Kastamonu)

ÖZ

Ormanların yönetimi, korunması ve geliştirilmesinde orman algısı en temel etmenlerdendir. Böylece, bu çalışma ile Kastamonu Orman Bölge Müdürlüğü'ne bağlı üç orman işletme şefliği sınırları içerisinde yer alan 6 farklı orman köyünde insanların ormanla olan ilişkileri ve geliştirdikleri koruma bilincinin incelenmesi amaçlanmıştır. Verilerin analizinde, cinsiyet farkındalığına göre bağımsız örneklem t-testi, yaş ve eğitim düzeyinde farkındalık seviyesi için de ANOVA testi kullanılmıştır. Bağımsız örneklem t-testi ile ağaç kesmenin ormansızlaşma üzerindeki etkisi, orman algısı, orman kaynaklarının gelir yaratma açısından önemi ile erkek ve kadın durumları için hakların farkındalığına ait puanlar arasında anlamlı bir fark olduğu ortaya konmuştur. İki veya daha fazla grup arasında bağımlı değişken üzerindeki ortalama puanlarda anlamlı bir fark olup olmadığını belirlemek için Tek Yönlü ANOVA testi kullanılmıştır. Buna göre, yaş gruplarının köylülere tanınan haklarda farkındalık, ormansızlaşma üzerine toprak erozyonunun etkisi ve yasaların orman korunmaya olumlu katkısı üzerinde anlamlı ($p<0,05$) bir etkisi söz konusudur. Ayrıca ağaç kesiminin ve toprak erozyonunun ormansızlaşmaya etkisinde eğitim düzeyi gruplarının anlamlı ($p<0,05$) bir etkisi vardır.

Anahtar Kelimeler: Orman, orman köyü, geçim kaynağı, koruma, algı.

Citing this article:
Ünal, H.E., Birben, Ü., 2021. Public perception of forest in forest villages: The case of Hanönü Forest District Directorate in Kastamonu province. Anatolian Journal of Forest Research 7(2): 95-106.

1. Introduction

Global forest resources are essential for the conservation of biological diversity and water and soil resources as well as for meeting our needs for wood and non-wood forest products (Siry et al., 2005) and embody environmental, economic, and social attributes for the quality of human life (Koyuncu and Yilmaz, 2011). As forestry is one of the few land-use sectors that involve very long periods in commodity production (Sotirov et al., 2017). Good governance is a fundamental element in achieving improved livelihoods and sustainable forest management. In contemporary forest management discussions, sustainable forest management is widely considered to be a desirable overall policy goal for achieving both biophysical and socio-economic objectives (Martin, 2011). Forest governance systems should be transparent, accountable, and participatory, including multi-stakeholder decision-making processes. Yet the development of effective policies and strategies to achieve them are problematic (Owubah et al., 2001). In addition to that forest policy actors are also constrained in their ability to anticipate and shape the unknown future (Sotirov et al., 2017). Forests, from past to present (Birben and Güneş, 2015) would be one of the most important topics of discussion for generations to come while being one of today's important topics (Ünal and Birben, 2017). To achieve sustainability, policy makers need to use many different tools to improve environmental governance through channels or ways that benefit local people (Obonyo et al., 2008). Communities will still rely on forests and natural resources in the next 100 years, as in the 19th or 20th centuries. Otherwise, socio-political conflict could become the major 21st century constraint to healthy, sustainable forest ecosystems and rural communities (Kennedy et al., 2001).

Public perception of the forest is fundamental in determining how forests will be managed, protected, or neglected. There is still not enough knowledge on how the public perception of forests effectively works and what structure of perceptions exists with regards to forest protection and sustainable use. Changes in meanings and perceptions of forests over the last century have suggested that there is a dynamic relationship between humankind and forests (Owubah et al., 2001). Theoretical and empirical studies have examined the role of several factors, including population growth, income, government policies, and insecure ownership (Deacon, 1999). Our main focus is on forest villager's perception of forest and forest conservation sheds light on the role of another important factor. It is problematic to stick to the top-down and command-and-control approach in carrying out large ecological restoration initiatives, without considering the local needs/desires (Liu et al., 2016). Legal restrictions are often inadequate to prevent loss of habitat and preserving adequate forest areas to protect biodiversity can be problematic (Mayer and Tikka, 2006; Best and Wayburn, 2013). While exploitation is a legitimate use of forests, in many places forests have been abused to finance political elites and curry political favours (White and Martin, 2002). Some groups are more powerful than others, in the sense that they are better able to influence policy outcomes (Šálka et al., 2016).

In developing countries, many of the forests are legally controlled by the state (Yin et al., 2016) as in the case of Turkey, and the economic value of forests has been shown to be the major cause of deforestation (Munasinghe, 1993; Dolisca et al., 2007). There are important cultural differences across these countries and even between sights within countries as well (Coleman, 2011). There is currently no mechanism to prevent environmentally damaging land uses (Rodgers, 2009). Deforestation confers largely private benefits, while reducing the positive externalities that forests provide to society. Because of this asymmetry between private and social benefits, rational individuals will deforest, despite the social harm (Liscow, 2013). It may require strengthening the capacity of both the agencies and the users (Meinzen-Dick, 2014).

Empirical social science methods are required to understand forest governance, and specifically how public perceptions are devolved to local communities and to ensure the sustainability of forests or social welfare of forest-dependent communities (Sandberg, 2007) as the population has increased and renewable resources have been subjected to increasing pressure (Pearce and Warford, 1993). The history of development efforts is littered with examples of policies that failed to take into account both women's and men's needs for access to and control over resources It is nonetheless important to develop policies that attempt to protect or strengthen (Meinzen-Dick et al., 1997). Public perception can be described as a set of economic, social and political relations that define the position of each individual with respect to the utilization of a resource for an active human role in the preservation of biodiversity, complexity, resilience, productivity, and sustainability (Haddad, 2003).

Forest villages constitute an important part of the settlements in rural areas. Forest villages are villages that are mostly located on mountain ridges or valley slopes far from the city centers, have an inefficient, fragmented, and small amounts of agricultural land, have very limited services such as education and health, livelihoods are almost exclusively forest-based, and there are few alternative employment opportunities. Those residing in these villages constitute the group with the lowest income throughout the country (Günşen ve Atmış, 2015). In the 1970′s, the ratio of the population of forest villages to the general rural area population was 36,30% (7.954.071) and decreased to 28,98% (6.827.500) in 2018. Despite this decreasing rate, approximately 1 out of every 3 people in rural areas is forest villagers (TOD, 2019). Therefore, the main purpose of this study is to reveal the perspectives and perceptions of forest villagers with limited income resources towards forests, which are economic and sustainable resources. Thus, the importance level of the view of the forest villagers towards the forest in the management and operation of these resources has been tried to be determined (Birben et al., 2018). This study and the data obtained are important for the protection and development of forest resources, and the biodiversity and ecosystem values of that resource.

2. Materials and Methods

2.1. Description of the study area

The field study was carried out in a total of 6 villages within the boundaries of three different Forest Sub-district Directorates which are Gökırmak, Çatalçam, and Hanönü affiliated to Hanönü Forest District Directorate of the Kastamonu Regional Directorates of Forestry, geographically, located within the borders of Kastamonu province in the Western Black Sea Region (Figure 1). All of the forests within the borders of the Hanönü Forest District Directorate are under the ownership of the state. Since the villages are generally located in mountainous areas and forests, agricultural lands and pastures are not sufficient. Due to the mining activities carried out in the district centre in recent years, the majority of the young population has migrated to the cities. This situation has also caused a decrease in the labour force to work in forestry. There is no production (log etc.) quota in the villages. The cuttings determined by ecosystem-based functional planning are directly proportional to the labor force of the villagers. In addition, the villagers undertake the production work as a cooperative. The firewood needs of the villagers are met in the form of cutting residues from the forests they produce. As of 2020, according to the formal General Directorate of Forestry (OGM) data about villages in three forest sub-district directorates are as follows.

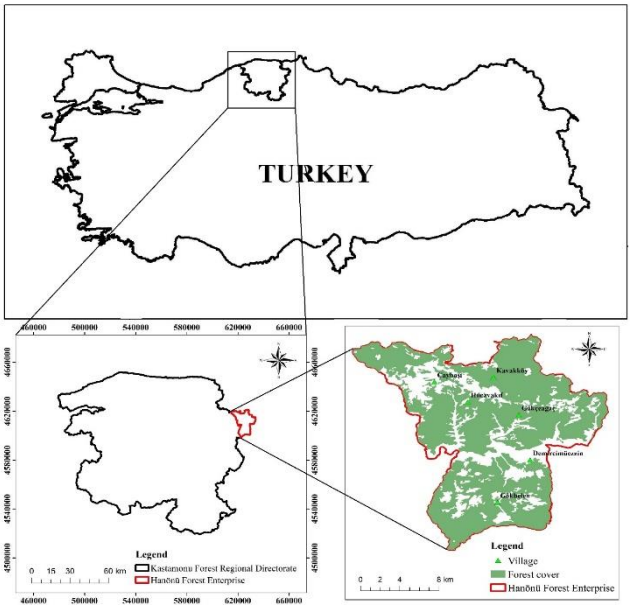

Fig. 1. Map of the study area

2.1.1. Gökırmak forest sub-district directorate

The area is geographically located within the borders of Kastamonu province in the Western Black Sea Region. The productive forest area is 3.806 hectares, and the non-productive forest area is 1.374 hectares. The general livelihood of the people in and adjacent to the State forest is agriculture and forestry. Livestock activities have been transformed into barn livestock with the pressure of the forestry organization. The people who have the status of forest villagers procure firewood from the forest within the framework of the rights provided by the Forest Law. In addition, it is engaged in forest labor, albeit to a limited extent, for unit price or daily wage. The negative effects of the people who are dependent on the forest in the area have started to decrease with the increase of environmental awareness.

2.1.2. Çatalçam forest sub-district directorate

Geographically, it is within the boundaries of Kastamonu province in the Western Black Sea Region. The productive forest area is 3.819 hectares, and the non-productive forest area is 2.141 hectares. The general livelihood of the people in and adjacent to the State forest is agriculture and forestry. Livestock has been transformed into animal husbandry with the pressure of the forestry organization. People who have the status of forest

villagers procure firewood from the State forest within the framework of the rights provided by the Forest Law. In addition, it is engaged in forest labor, albeit to a limited extent, for unit price or daily wage. The negative effects of the people, who are dependent on the forest, on the forest have started to decrease with the increase of environmental awareness. However, there are still areas where the public exerts negative pressure on forests.

2.1.3. Hanönü forest sub-district directorate

In terms of administration, the Hanönü forest sub-district directorate is within the boundaries of Kastamonu Province. Hanönü forest sub-district directorate is affiliated to Kastamonu Regional Directorate of Forestry. The productive forest area is 2,889 hectares, and the non-productive forest area is 2.480 hectares. The most important source of income is agriculture and animal husbandry. In the region, income is also provided from forestry works, albeit in low amounts. People benefit from forests via transportation, slaughtering, beekeeping, and grazing. They also get lumber and firewood. From time to time, illegal cutting and opening are in question. There is an ongoing immigration to the big cities from the region.

2.2. Data collection

A questionnaire survey was carried out from July to August 2019 with a multistage sampling technique. Using this sampling approach, we listed the villages within the Hanönü, Gökırmak, and Çatalçam Forest Sub-district Directorates and selected randomly 6 villages for the survey. Kastamonu province for the study due to the fact that the forests are of special importance for the people who continue their lives in or adjacent to the forest in Kastamonu. The area where the selected villages are located is also such an example. Because the majority of these villages' population surrounding is forest and directly depends on forest resources for different purposes of livelihoods. The sampling size that needs to be surveyed from 6 selected villages has been calculated as minimum of 138 participants. However, the number of questionnaires was determined as 150 by considering errors, etc. The questionnaire was administered to the respondents through face-to-face interviews, conducted by the researchers at the interviewees' homes (Table 1). In instances where the household heads were not available, any member in the household above 18 years of age was interviewed. The collection of primary data rested mainly on a detailed three-page questionnaire, which included questions on household demographics, household's livelihood assets. Also, it consists of 5- and 6-Point Likert Scale questions regarding the viewpoint of the households to the forest and their relations with the forest. In order to determine the forest perception of the people; the participants were asked questions about their perspective of forests; households' dependence on forests; the importance of forest resources; the effect of forest resources on household income; the effect of forest usage on forest degradation; the effect of logging, wildfire, erosion, and the effect of agricultural use purposes on deforestation. Likert scale, which is a psychometric scale that provides a range of responses to a given question or statement from which respondents choose the one that best sides with their view or belief (Louis et al., 2000). We used five response categories, from 1 – not important to 5 – extremely important in order to develop interval/quantitative variables for further analysis. The survey was carried out primarily with the headman of each village. As a result of pretesting and discussion, some questions were developed to increase clarity, and some were removed from the questionnaire.

Table 1. Village statistics and the percentage of households surveyed in each village

Villages	Number of inhabitants	Number of household	Number of survey households (% of households surveyed in each village)
Demircimüezzin	73	60	14 (23%)
Çaybaşı	134	40	23 (58%)
Kavak	113	60	33 (55%)
Gökbelen	134	80	24 (30%)
Hocavakıf	127	50	33 (66%)
Gökçeağaç	146	100	23 (23%)

The following formula was used to calculate the sample size (Baş, 2008):

$$SS = \frac{N*Z^2*P*Q}{(N-1)d^2 + (Z^2*P*Q)}$$

N: population size
P: sample proportion (0.9)
Q: 1-P
Z: Z value (1.96 for 95% confidence level and 1.64 for 90% confidence level)
d: margin of error (0.05 for 95% and 0.1 for 90%)

2.3. Data analysis

Data was compiled and managed using Statistical Package for Social Sciences (SPSS). Descriptive statistics in the form of frequency, distribution was used to summarize socio-demographic data. Researchers who include Likert-scales in their questionnaires generally use 5 scales as the number of options as Likert does. However, it is seen in the literature that different option numbers from 3 to 18 are used and the most suitable option number is the subject of discussion (Preston and Colman, 2000). Although it has a very common usage, there is a long period of confusion and disagreement about the Likert scale and the correct use and analysis of Likert-scale questions (Carifio and Perla, 2008). In the analysis of the data obtained from the Likert scale, which approach yielded safer and more consistent results has been tested in different studies. Kaptein et al. (2010) examined the reliability of nonparametric tests and parametric tests in the analysis of data obtained from the 7-point Likert scale. The researchers compared the parametric ANOVA test and its non-parametric alternative, the Kruskal-Wallis test, and found that the nonparametric test gave more reliable results, especially when the sample size was small (n<50). Glass et al. (1972) also use the parametric ANOVA test in the analysis of data obtained from 5–7 point Likert scale. They found that using this test, extremely stable and reliable results can be obtained even in cases where the interval prerequisites were violated (except for the prerequisite for variance). De Winter and Dodou (2010) compared the t-test and the Mann-Whitney-Willcoxon test in the analysis of the data obtained from the 5-point Likert scale, and the probability of the test was less than 3% in both tests, the strength of the test in both approaches. They found that they were close to each other, so they thought it would not be wrong to choose any of them. According to Boone and Boone (2012), Likert scale items are created by calculating compound points (total or average) from four or more Likert-type items; therefore, the compound score for Likert scales should be analyzed on the range measurement scale.
In our study, we used to one-way analysis of variance (ANOVA) for selected socio-demographic variables to determine whether there is a significant difference in mean scores. These tests involved were t-test mean scores by gender awareness, ANOVA level of awareness by ages, ANOVA level of awareness based on education levels.

3. Results

3.1. Household profiles

Table 2 outlines the general characteristics of the households. According to the data, the proportion of men was 76.7% (n = 115) and women was 23% (n=35) for the gender distribution in the total sample population. The average age of household heads was in the middle-age range (M=44.2, SD=11.7). In terms of educational levels, 75% (n=112) of the household heads did not have any formal education (27.3%, n= 41) or were primary school graduates (47.3%, n=71). Only five household heads (3.3%) had a higher educational level. The rate of those who declared that their monthly income is more than 428 $ (3001 ₺) is 89% (n = 134).

3.2. t-test mean scores by gender awareness

It has been examined whether there is a statistical difference between the factors affecting the awareness, reaching forest resources, and deforestation according to gender. We conducted t-test to comparing the effect of logging on deforestation, point of view to forest, the importance of forest resources in terms of income generation, awareness of rights, the effect of fire on deforestation, the effect of soil erosion on deforestation, the effect of agricultural opening on deforestation, the positive contribution of laws to forest problems, the effect of lack of transportation in getting forest resources, the effect of forest boundary in getting forest resources, the effect of law enforcement officers in getting forest resources for gender. The options below are statistically significant differences by gender in the comparison.

Table 2. Characteristics of Household's

Factors	Items	μ (σ)	%	n
Gender	Male		76.7	115
	Female		23.3	35
Age (years)		44.2 (11.7)		
Education	None		27.3	41
	Primary		47.3	71
	Secondary		22	33
	Tertiary		3.3	5
Average income (monthly)	< 1000 ₺		0.7	1
	1001-2000 ₺		3.3	5
	2001-3000 ₺		6.7	10
	>3001 ₺		89.3	134

μ: Mean, σ: Standard deviation, n: Subset of the sample

Table 3. t-tests results by gender awareness

Factors	Gender	μ (σ)	t-value	*p*-value
Effect of logging on deforestation	female male	1.7 (0.83) 2.5 (1.1)	4.872	0.00
Point of view to forest	female male	2.1 (1.41) 2.7 (1.37)	2.301	0.023
Importance of forest resources in terms of providing household income	female male	3.2 (1.09) 2.4 (1.2)	3.376	0.000
Awareness of rights	female male	3.5 (1.04) 4.04 (0.98)	2.62	0.010

According to the Table 3, an independent-samples t-test was conducted to compare the effect of logging on deforestation for males and females. The highest mean score of 2.5 by males for the effect of logging on deforestation awareness indicating males had a higher level of awareness than females. Mean scores for women (μ = 1.7) for the effect of logging on deforestation statistics is t (70) = 4.872 with t-test significant differences in the level of $p<0.05$. These results suggest that the view of gender on the effect of logging on deforestation is different. Comparing the effect of point of view to the forest for male and female. There was a significant difference in the scores for female (μ=2.1) and male (μ =2.7) conditions; t (148) = 2.301 with t-test significant differences in the level of $p<0.05$. So, males had a higher level of awareness than a female of point of view to the forest. It is also has been compered for the importance of forest resources in terms of income generation for male and female in Table 3. As a result, there was a significant difference in the scores for female (μ =3.2) and male (μ =2.4) conditions; t (148) = 3.376 with t-test significant differences in the level of $p<0.05$. It has suggested that the view of gender on the importance of forest resources in terms of providing household income is different and females had the higher level of awareness than males. Based on Table 3, a highest mean score of 4.04 by males for awareness of rights indicating males had a higher level of awareness than females with t (148) = 2.62 with t-test significant differences in the level of $p<0.05$.

3.3. ANOVA level of awareness by ages

We used one way ANOVA for determining if a significant difference in means scores on the dependent variables (awareness of rights, effect of

soil erosion on deforestation, positive contribution of laws to forest problems, effect of logging on deforestation, effect of lack of transportation in getting forest resources, providing household income, the effect of law enforcement officers on access to the forest, point of view to forest, impact of forest boundary on access to forest, the impact of agricultural clearing activities on deforestation, the impact of fire on deforestation, effect of lack of transportation in getting forest resources) exist across 2 or more groups. Results are shown in Table 4. Our null hypothesis is as follows:

Ho= There is no significant difference between participants' ideas on the effect of awareness on deforestation within age categories.

Table 4. Comparison of different age groups in terms of awareness of rights, effect of soil erosion on deforestation and positive contribution of laws to forest problems

Variable	Age Groups				F-value	*p*-value
	25-35 $\mu \pm \sigma$	36-45 $\mu \pm \sigma$	46-55 $\mu \pm \sigma$	56+ $\mu \pm \sigma$		
Awareness of rights	4.03 ± 1.21^{ab}	4.20 ± 0.80^{a}	3.70 ± 0.96^{ab}	3.50 ± 1.02^{b}	3.67	0.014
Effect of soil erosion on deforestation	2.26 ± 0.93^{b}	2.50 ± 0.90^{b}	2.83 ± 1.09^{ab}	3.12 ± 0.85^{a}	4.72	0.004
Positive contribution of laws to forest problems	1.97 ± 0.57^{b}	2.29 ± 0.71^{ab}	2.56 ± 0.89^{a}	2.62 ± 0.76^{a}	5.18	0.002

The different letters (a>ab>b) show a statistically significant difference between mean variables of awareness of rights at $p<0.005$. The different letters (a>ab>b) show a statistically significant difference between mean variables of the effect of soil erosion on deforestation at $p<0.05$. The different letters (a>ab>b) show a statistically significant difference between mean variables of the positive contribution of laws to forest problems at $p<0.05$.

According to Table 4, there was a significant effect of age groups on awareness of rights [F3, 146 = 3.678, $p<0.05$], effect of soil erosion on deforestation [F3, 146 = 4.725, $p<0.05$] and positive contribution of laws to forest problems [F3, 146 = 5.188, $p<0.05$]. Post hoc comparisons using the Tukey HSD (Honest Significant Difference) test indicated that the mean difference of awareness of rights for the 36-45 age group ($\mu = 4.20$, $\sigma = 0.80$) was significantly different than the 56+ age group ($\mu = 3.50$, $\sigma = 1.02$). 36-45 age groups are more common in villages than other age groups. Therefore, individuals in these age groups are generally employed in forestry and other jobs with 26-35 age group. For this reason, it is possible that they have more awareness of their rights. The post hoc analysis also revealed that the mean score for the 25-35 age group ($\mu = 2.26$, $\sigma = 0.93$) and 36-45 age groups ($\mu = 2.50$, $\sigma = 0.90$) were significantly different than the 56+ age group ($\mu = 3.12$, $\sigma = 0.85$) on awareness of effect of soil erosion on deforestation. Similar reasons can be cited for the awareness of soil erosion on deforestation. Other dependent variable with a significant difference in means scores according to age groups is the positive contribution of laws to forest problems. Post hoc comparisons indicated that the mean score for the 25-35 age group ($\mu = 1.97$, $\sigma = 0.567$) was significantly different than the 46-55 age group ($\mu = 2.57$, $\sigma = 0.90$) and 56+ age group ($\mu = 2.63$, $\sigma = 0.77$). The age group of 26-35 and the age group of 36-45 are more educated than other age groups. In the 26-35 age group, unlike the 36-45 age group, there are also high school, and university educated people. Especially while almost all of the individuals in the age group 56 are uneducated, half of those in the 46-54 age group are uneducated and half of the primary school. For this reason, we can say that the awareness of the 26-35 age group regarding the contribution of the laws in solving the problems related to forestry is higher than 46-55 and 56+ age groups.

3.4. ANOVA level of awareness by education levels

Also, we selected participants' education levels if a significant difference in means scores on the dependent variables. The results and evaluations that are found statistically significant according to the groups are given below.

Table 5. Comparison of different education levels in terms of the effect of logging on deforestation and the effect of soil erosion on deforestation

Variable	Education Levels				F-value	*p*-value
	Uneducated μ ± σ	Primary μ ± σ	Secondary μ ± σ	University μ ± σ		
Effect of logging on deforestation	2.48 ± 0.92^{ab}	2.40 ± 1.11^{ab}	1.81 ± 0.95^{b}	3.20±1.09^{a}	4.35	0.006
Effect of soil erosion on deforestation	3.17 ± 0.86a	2.42 ± 0.96^{ab}	2.48 ± 0.97^{ab}	2.20 ±0.83^{b}	6.32	0.000

The different letters (a>ab>b) show a statistically significant difference between mean variables of the effect of logging on deforestation at $p<0.05$. The different letters (a>ab>b) show a statistically significant difference between mean variables of the effect of soil erosion on deforestation at $p<0.05$.

According to Table 5, a statistically significant difference was found according to mean of the education levels in terms of only for two dependent variables. When the results are examined for the effect of logging on deforestation there was a significant effect of education levels for the conditions [F3,146 = 4.357, $p<0.05$]. Post hoc comparisons using the Tukey HSD (Honest Significant Difference) test indicated that the mean score for the None (μ = 2.49, σ = 0.93) and Primary (μ = 2.41, σ = 1.11) education groups were significantly different than the Secondary (μ = 1.81, σ = 0.95) education group. In forest villages that continue their lives depending on the forest, the highest demand from the forest is in the form of firewood and wood raw materials for other uses. In order to meet the wood need, it is possible to cut trees for the provision of wood raw materials, sometimes illegally, as well as legally provided from the institution. The fact that there are younger and more educated individuals who do this job is also effective in the emergence of such a result in the analyzes. Table 5 also shows that there was a significant effect of education levels on the effect of soil erosion on deforestation level for the conditions [F3,146 = 6.327, $p<0.05$]. Post hoc comparisons indicated that the mean score for the None (μ = 3.17, σ = 0.86) education group was significantly different than the Primary (μ = 2.42, σ = 0.97) and Secondary (μ = 2.48, σ = 0.97) education groups. The answers of the respondents show that the impact of soil erosion on deforestation is either partially important or not very important for the uneducated individuals. On the other hand, more than half of the individuals with primary and secondary education level stated that the impact of soil erosion in deforestation is extremely or very important.

4. Discussion

We deemed it appropriate to consider the issues in this section in two sub-groups and to address forest dependency and awareness of forest protection. Because, despite the fact that the surveys applied to the participants where forests were on the boundaries of forest villages, the questions were asked to determine whether the forests are important for the people living in these settlements and whether they have sufficient awareness about the protection of these resources while benefiting from the forest resources.

4.1. People's Dependence on Forest

For more than half of the participants, 54% (n = 82), forest is important income generating resources. Especially in rural areas in developing countries, in the settlements selected as an example for our study, there is dependence on forest and forest resources in many respects not only as a source of income, but also medical, energy needs, etc. There are studies supporting our findings as such: Bahuguna (2000), Somsoulivong (2016), Shackleton et al. (2007), Chao (2012), Chandra and Kanti (2018), Beckley (1998), Garekae et al. (2017). In our study, approximately 83% of the participants stated that forest resources are very important for them in terms of firewood. Williams and Shackleton (2002) reported that more than 80% of rural households and Chao (2012) reported that more than 90% of rural households still use firewood as the primary energy source. Mamo et al. (2007) stated that firewood, with 59% of the income generated from forests, is used for economic purposes by selling it both in households and in the market. With the idea obtained from the statements of the household heads interviewed, underemployment opportunities have a great impact on this situation. Similarly, Sapkota and Odén (2008) found that unemployed households collected higher

amounts of wood and non-wood forest products than forests compared to the employed households. On the contrary, Adhikari et al. (2004) stated that other non-wood forest products such as leaves, forage, grass are collected more than firewood. In these villages, although the forest stands out as the main source of income, it can be said that agriculture is an income generating activity (Fikir et al., 2016). 16% (n = 11) of the participants stated that they earned all their income from agriculture, and 19% (n = 29) stated that half of their income was derived from agricultural activities. Mamo et al. (2007) also stated that agriculture is the primary source of income for 40% of the households.

4.2. Conservation Awareness

Whether there is a statistical difference between the mean values of factors such as deforestation made by gender and access to forest resources was examined. According to the results obtained, it was observed that the effects of tree cutting on deforestation; the perspective of the forest; the importance of forest resources in terms of income; and the awareness of rights factors were perceived differently among women and men. Ukwetang et al. (2014) and Ukwetang et al. (2014) study results showed that gender attitude and awareness have a great impact on the protection of forest resources. It is also stated that both men and women show the same level of awareness regarding the protection of forest resources. There are also studies that show that there are completely gender differences in forest and nature protection in terms of gender attitude and awareness. According to David (2016), men and women may have different motives to conserve forest resources due to their different roles and obligations at home and even at the community level. In his study, he explained that women living around the Olokemeji forest reserve in Nigeria tend to adopt practices that apply less pressure on forests, such as growing crops that require fewer nutrients and using environmentally friendly farming systems. Iizuka (2016) stated in her study that women are generally believed to be more sensitive than men, and this is because women are potentially more environmentally friendly than men. While Dietz et al. (1998) and Zelezny et al. (2000) stated that women are more willing to protect nature than men, Van Fleet et al. (2012), on the other hand, revealed that there is no gender-related situation in terms of protection, unlike the other mentioned authors.

Ukwetang et al. (2014) observed the attitudes of villagers and their awareness levels towards the conservation of forest resources. They emphasized that not only their socio-economic status, but also their education levels affect their awareness of forest resources protection. Van Fleet et al. (2012) found that there is a positive relationship between the level of education and the protection of forests. In this regard, it was emphasized that there are significant awareness differences between high school graduates and those who graduate or study outside the university. Wekesa (2017) stated that people with high education level do not prefer to use firewood as an energy source because of the high opportunity cost of collecting firewood. On the contrary, Oliver (2004) explained that the level of education does not affect the public's awareness of forest protection. Mbuvi (2011) found that the reason for the low environmental awareness among young people aroused by insufficient high school education. Van Fleet et al. (2012) stated that forest protection awareness has no connection with age. On the opposite Wekesa (2017) emphasized that older people are more willing to participate in the protection and management of forests than young people. Koech et al. (2009) found that young people are willing to participate in forest protection and management practices.

Orimaye et al. (2015) revealed that 27% of the participants stated that the most important human activity that hinders forest protection is illegal cutting. One of the important results of the same study was that a higher percentage of participants had knowledge of forest conservation. Mbuvi (2011) stated that based on the information obtained from foresters in Kakamega, community members were mostly interested in the need for urgent needs and therefore were far from the idea of planting more trees.

The problem of protecting forests is the most important aspect of forestry history in Turkey (Talu, 1944). Many factors interact with each other in the relationship between forests and society. Some factors may have a high effect, while others may be lower. However, the most basic feature is that it is in mutual interaction and this interaction takes place through social and economic intermediary variables (Şen and Toksoy, 2006). On forest-society relations in Turkey, Tokmanoğlu (1974), Geray (1989;1993), Tolunay and Korkmaz (2005), Toksoy et al (2005), Şen and Toksoy (2006), Solmaz (2007), Alkan and Toksoy (2008), Erdönmez and Erol (2005), Günşen, (2012), Alkan (2014) conducted many studies on forest villages. However, this study, with its data and results, is especially focused on the forest perception of forest villagers.

5. Conclusions

In countries such as Turkey, where dense forests in rural areas, while creating forest policies from the fact that the education level of society low in these areas and to create positive awareness for forests, there should be an interaction forefront and efforts are needed to establish the perceptions and attitudes of the local people. Because the lack of access to mass communication tools and the interest in technology in the countryside makes this mandatory. Nevertheless, it is seen that forest-public relations constitute one of the important problems of the forestry sector in which solutions are sought. Another important topic is forestry education; it has a critical importance in terms of achieving national development goals and sustainable forestry management.

Although the migration in the region was mainly due to economic reasons, the expropriations made for mining activities in the study area made it the most important factor that led forest villagers to migrate.

In order to improve the forest perception in a positive way, it is recommended to increase the amount of personal firewood subsidies and to diversify the loan and project opportunities provided by ORKÖY specific to the area. Because, in the face-to-face interviews with the authorities, it was stated that forest crimes are very low in the area. If the locals could benefit more from the above-mentioned opportunities, it would also positively facilitate these processes.

References

Adhikari, B., Di Falco, S., Lovett, J.C., 2004. Household characteristics and forest dependency: evidence from common property forest management in Nepal. Ecological Economics 48, 245-257.

Alkan, S., Toksoy, D., 2008. Orman köylerinde sosyo-ekonomik yapı: Trabzon ili örneği. Kastamonu Üniversitesi Orman Fakültesi Dergisi, 8(1), 37-46.

Alkan, S., 2014. Kırsal nüfusun değişiminin, ormanlar ve ormancılık üzerine etkileri (Trabzon ili örneği). Kastamonu Üniversitesi Orman Fakültesi Dergisi, 14(1), 69-78.

Bahuguna, V.K., 2000. Forests in the economy of the rural poor: an estimation of the dependency level. AMBIO: A Journal of the Human Environment 29, 126-129.

Baş, T., 2008. Anket: Anket nasıl hazırlanır?, Anket nasıl uygulanır?, Anket nasıl değerlendirilir? Seçkin yayıncılık. Ankara.

Beckley, T.M., 1998. The nestedness of forest dependence: a conceptual framework and empirical exploration. Society & Natural Resources 11, 101-120.

Best, C., Wayburn, L.A., 2013. America's Private Forests: Status and Stewardship. Island Press.

Birben, Ü., Güneş, Y. 2015. Amerika Birleşik Devletleri'nde orman mülkiyeti. Anadolu Orman Araştırmaları Dergisi, 1 (1-2), 22-32.

Birben, Ü., Ünal, H.E., Karaca, A., 2018. Orman kaynaklarına ilişkin toplumsal algının incelenmesi (Çankırı kent merkezi örneği). Turkish Journal of Forestry, 19 (1), 76-82. DOI: 10.18182/tjf.394139.

Boone, H.N., Boone, D.A., 2012. Analyzing likert data. Journal of Extension 50, 1-5.

Carifio, J., Perla, R., 2008. Resolving the 50-year debate around using and misusing likert scales. Medical education 42, 1150-1152.

Chandra, D.K., Kanti, D.M., 2018. Forest dependency of peripheral communities: an empirical study in the fringe of Laokhowa and Burhachaporı wildlife sanctuaries in assam, India, Journal of Environmental Research and Development 12, 351-358.

Chao, S., 2012. Forest Peoples: Numbers Across the World, Forest Peoples Programme, Moreton-in-Marsh, UK. In, Retrieved on, p. 2017.

Coleman, E.A., 2011. Common property rights, adaptive capacity, and response to forest disturbance. Global Environmental Change 21, 855-865.

David, N.O., 2016. Factors influencing forest conservation projects in Trans Mara Sub-County, Narok County, Kenya. In. University of Nairobi.

De Winter, J.C., Dodou, D., 2010. Five-Point Likert Items: T-test versus Mann-Whitney-Wilcoxon. In, Practical Assessment, Research & Evaluation. Citeseer.

Deacon, R.T., 1999. Deforestation and ownership: evidence from historical accounts and contemporary data. Land Economics, 75, 341-359.

Dietz, T., Stern, P.C., Guagnano, G.A., 1998. Social structural and social psychological bases of environmental concern. Environment and behavior 30, 450-471.

Dolisca, F., McDaniel, J.M., Teeter, L.D., Jolly, C.M., 2007. Land tenure, population pressure, and deforestation in Haiti: the case of Forêt des Pins Reserve. Journal of Forest Economics 13, 277-289.

Erdönmez, C., Erol, S.Y., 2009. Orman toplum ilişkileri açısından tarihsel bir inceleme: Polonezköy örneği. Bartın Orman Fakültesi Dergisi, 11(15), 35-44.

Fikir, D., Tadesse, W., Gure, A., 2016. Economic contribution to local livelihoods and households dependency on dry land forest products in Hammer District, Southeastern Ethiopia. International Journal of Forestry Research 2016, 1-11.

Garekae, H., Thakadu, O.T., Lepetu, J., 2017. Socio-economic factors influencing household forest

dependency in Chobe enclave, Botswana. Ecological Processes 6, 40.

Geray, U., 1989. Bir bölüm orman köylerinin sosyo-ekonomik özellikleri (les caracterıstıques socıo-economıques d'une part des paysans forestıers). Journal of the Faculty of Forestry Istanbul University, 39(2), 29-41.

Geray, U., 1993. Türkiye'de orman kaynakları yönetiminin geliştirilmesine ilişkin sorunlar. Journal of the Faculty of Forestry Istanbul University, 43(2), 15-30.

Glass, G.V., Peckham, P.D., Sanders, J.R., 1972. Consequences of failure to meet assumptions underlying the fixed effects analyses of variance and covariance. Review of Educational Research 42, 237-288.

Günşen, H.B., 2012. Orman köylerinde iç göçleri etkiyen faktörler (Bartın Kastamonu örneği). Doktora Tezi (yayınlanmamış). Bartın Üniversitesi Fen Bilimleri Enstitüsü Orman Mühendisliği Anabilim Dalı, Bartın, 187s.

Günşen, H.B., Atmiş, E., 2015. İç göçlerin orman köylerinde ve ormancılık çalışmaları üzerindeki etkileri (effects of internal migration in forest villages and forestry). IV. Ormancılıkta Sosyoekonomik Sorunlar Kongresi Bildiriler Kitabı (IV. Socioeconomic Problems in Forestry Congress Proceedings), p177-190.

Haddad, B.M., 2003. Property rights, ecosystem management, and John Locke's labor theory of ownership. Ecological Economics 46, 19-31.

Iizuka, M., 2016. Role of environmental awareness in achieving sustainable development.

Kaptein, M.C., Nass, C., Markopoulos, P., 2010. Powerful and consistent analysis of Likert-type rating scales. In, Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, pp. 2391-2394.

Kennedy, J.J., Thomas, J.W., Glueck, P., 2001. Evolving forestry and rural development beliefs at midpoint and close of the 20th century. Forest Policy and Economics 3, 81-95.

Koech, C., Ongugo, P., Mbuvi, M., Maua, J., 2009. Community forest associations in Kenya: challenges and opportunities. Kenya Forestry Research Institute.

Koyuncu, C., Yilmaz, R., 2011. Deforestation, corruption, and private ownership in the forest sector. Quality & Quantity 47, 227-236.

Liscow, Z.D., 2013. Do property rights promote investment but cause deforestation? Quasi-experimental evidence from Nicaragua. Journal of Environmental Economics and Management 65, 241-261.

Liu, P., Yin, R., Li, H., 2016. China's forest tenure reform and institutional change at a crossroads. Forest Policy and Economics 72, 92-98.

Louis, C., Keith, M., Lawrence, M., 2000. Research Methods in Education 5th Edition. In. New York.

Mamo, G., Sjaastad, E., Vedeld, P., 2007. Economic dependence on forest resources: A case from Dendi District, Ethiopia. Forest Policy and Economics 9, 916-927.

Martin, M., 2011. Reforming Forest Tenure: Issues, Principles and Process. FAO, Rome.

Mayer, A.L., Tikka, P.M., 2006. Biodiversity conservation incentive programs for privately owned forests. Environmental Science and Policy 9, 614-625.

Mbuvi, D.T., 2011. Youth Entrepreneurial Activities and Forest Conservation: a case study of Youth Groups in Kakamega Forest Area of Kenya. In. University of Nairobi, Kenya.

Meinzen-Dick, R., 2014. Property rights and sustainable irrigation: A developing country perspective. Agricultural Water Management 145, 23-31.

Meinzen-Dick, R.S., Brown, L.E., Feldstein, H.S., Quisumbing, A.R., 1997. Gender, property rights, and natural resources. World development 25, 1303-1315.

Munasinghe, M., 1993. Environmental Economics and Biodiversity Management in Developing Countries. Ambio 22, 126-135.

Obonyo, E., Mogoi, J., Ongugo, P., 2008. Property rights and forest management: Whose reality counts? In. KEFRI, Kenya, p. 3.

Oliver, P., 2004. Developing effective partnerships in natural resource management. Social Innovations In Natural Resource Management, 58-60.

Orimaye, O., Olumide Odunayo, O., J.N, O., 2015. Conservation awareness among Secondary School Students around Ise Forest Reserve, Ekiti State. In, 5th Conference of Nigeria Tropical Biology Association, Nigeria.

Owubah, C.E., Le Master, D.C., Bowker, J.M., Lee, J.G., 2001. Forest tenure systems and sustainable forest management: the case of Ghana. Forest Ecology and Management, 149, 253-264.

Pearce, D.W., Warford, J.J., 1993. World without end: economics, environment, and sustainable development. Oxford University Press.

Preston, C.C., Colman, A.M., 2000. Optimal number of response categories in rating scales: reliability, validity, discriminating power, and respondent preferences. Acta Psychologica 104, 1-15.

Rodgers, C., 2009. Property rights, land use and the rural environment: A case for reform. Land Use Policy 26, S134-S141.

Šálka, J., Dobšinská, Z., Hricová, Z., 2016. Factors of political power — The example of forest owners associations in Slovakia. Forest Policy and Economics 68, 88-98.

Sandberg, A., 2007. Property rights and ecosystem properties. Land Use Policy 24, 613-623.

Sapkota, I.P., Odén, P.C., 2008. Household characteristics and dependency on community forests in Terai of Nepal. International journal of social forestry, 1, 123-144.

Shackleton, C.M., Shackleton, S.E., Buiten, E., Bird, N., 2007. The importance of dry woodlands and forests in rural livelihoods and poverty alleviation in South Africa. Forest Policy and Economics 9, 558-577.

Siry, J.P., Cubbage, F.W., Ahmed, M.R., 2005. Sustainable forest management: global trends and opportunities. Forest policy and Economics, 7, 551-561.

Somsoulivong, B., 2016. Forest resources dependency of the rural community: A case study in Bokeo province, Lao PDR. In. Economy and Environment Program for Southeast Asia (EEPSEA).

Sotirov, M., Blum, M., Storch, S., Selter, A., Schraml, U., 2017. Do forest policy actors learn through forward-thinking? Conflict and cooperation relating to the past, present and futures of sustainable forest management in Germany. Forest Policy and Economics 85, 256-268.

Şen, G., Toksoy, D., 2006. Türkiye'de nüfus orman ilişkisi. Ormancılıkta Sosyo-Ekonomik Sorunlar Kongresi Bildiriler Kitabı, 26-28 Mayıs 2006. Ilgaz-Çankırı, s:108-117.

Solmaz, E. 2007. Orman köylülerinin kalkınmasına yönelik uygulanan politikaların yoksulluk düzeyi ve orman kaynaklarının kullanımına etkisi Muğla örneği. Doktora Tezi, Muğla Üniversitesi, Sosyal Bilimler Enstitüsü, İktisat Anabilim Dalı, Muğla, 257s.

Talu, O., 1944. Orman Hükümleri, 246 s, A.R. İncealemdaroğlu Matbaası, Zonguldak.

TOD. 2019. Türkiye Ormancılığı 2019 (Vol. 47). Türkiye Ormancılar Derneği. Ankara.

Tokmanoğlu, T. 1974. Düzenli ormancılık yönünden orman köy ilişkilerinin doğurduğu sorunlar ve çözüm yolları. Journal of the Faculty of Forestry Istanbul University, 113-118.

Toksoy, D., Ayaz, H., Şen, G., Özden, S. 2005. Doğu Karadeniz Bölgesinde orman-köylü ilişkileri. Kafkas Üniversitesi, Artvin Orman Fakültesi Dergisi, 6 (1-2), 79-85.

Tolunay, A., Korkmaz, M. 2005. Orman köylülerinin orman kaynaklarından yararlanma haklarının tarihsel gelişimi. I. Çevre ve Ormancılık Şurası, 22-24 Mart 2005, s.1559-1566, Antalya.

Ukwetang, J.O., Otu, J.E., Neji, H.A., 2014. Assessing the influence of gender awareness and attitude to forest resource conservation in Cross River State. Research on humanities and social sciences 4, 82-86.

Ünal, H. E., Birben, Ü., 2017. Küresel orman kaynaklarının durumu ve eğilimlerdeki değişimler: 1990-2015 dönemi üzerine bir değerlendirme. Anadolu Orman Araştırmaları Dergisi, 3(2), 167-182.

Van Fleet, T.E., Kittredge, D.B., Butler, B.J., Catanzaro, P.F., 2012. Reimagining family forest conservation: Estimating landowner awareness and their preparedness to act with the Conservation Awareness Index. Journal of Forestry, 110, 207-215.

Wekesa, I.W., 2017. Examining the role of community participation in forest management and conservation in Kimothon Forest, Trans nzoia County, Kenya. In. Thesis for the degree of master's in public administration of the University.

White, A., Martin, A., 2002. Who owns the world's forests? Forest tenure and public forests in transition. Forest Trends; Center for International Environmental Law, Washington, D.C.

Williams, A., Shackleton, C.M., 2002. Fuel wood use in South Africa: Where to in the 21st Century? Southern African Forestry Journal, 196, 1-7.

Yin, R., Zulu, L., Qi, J., Freudenberger, M., Sommerville, M., 2016. Empirical linkages between devolved tenure systems and forest conditions: Challenges, findings, and recommendations. Forest Policy and Economics, 73, 294-299.

Zelezny, L.C., Chua, P.-P., Aldrich, C., 2000. New ways of thinking about environmentalism: elaborating on gender differences in environmentalism. Journal of Social Issues 56, 443-45.